

REMARKS

Claims 1-49 are pending in this application. On July 6, 2005, the Examiner rejected claims 1, 8-13, 29, and 37-49, and objected to claims 2-7, 14-28, and 30-36 as including allowable subject matter. In response, Applicants amend herein claims 1-3, 7, 14, 29, 30, 37, 38, and 47. Applicants respectfully traverse the rejection and request reconsideration based on the following remarks.

Election/Restrictions

Applicants thank the Examiner for reconsidering her position regarding the restriction requirement.

Claim Rejections under 35 U.S.C. § 102

In order to establish a proper 102 rejection, each element of the claim must be disclosed expressly or inherently within the prior art. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Claim 37

The Examiner rejected claim 37 under 37 C.F.R. 102(e) as being anticipated by U.S. Publication No. 2004/0070399 ("Olsson").

Claim 37 recites "means for determining a signal direction in a conductor; and means for distinguishing a target conductor based on the determined signal strength and signal direction," (emphasis added). However, Olsson appears to be silent with respect to means to determine a

signal direction in a conductor and means to distinguish a target conductor based on the determined signal strength and signal direction. Olsson does not appear to disclose a signal configured to provide data concerning a direction of a signal to distinguish a target conductor.

Olsson teaches that:

The preferred embodiment 30 of the sonde and line locator system of the present invention uses the multi-directional antenna arrays 44 and 46 (FIGS. 4 and 5) along with circuit means (FIG. 6) that includes advanced software programming to make pinpointing sondes and tracing buried lines fast, accurate and easy. The GUI implemented via the display 48 (FIGS. 2 and 7) allows the operator to "see" the fields and to quickly resolve complex locating problems. The preferred embodiment 30 measures and displays electromagnetic fields emitted by long conductors such as energized wires, video inspection camera push cables, conduit or pipes when in its tracing mode. The passive AC tracing mode is a specialized case of the tracing mode where the line is already energized with 50 or 60 Hz electrical power. Active transmitters such as sondes are located in the sonde mode. Unlike conventional paddle or stick locators, which can only measure signal strength in the direction of the individual antenna(s), the preferred embodiment 30 measures both signal strength and field angles in three dimensions (3D). This enhanced capability makes it possible for the preferred embodiment 30 to indicate a mapping display on the LCD 48.

Olsson at paragraph 45 (emphasis added). Olsson further provides:

Referring to FIG. 11, in the SEARCH view a numeric (digital) signal strength is indicated at 172 on the display 48. This number gets larger as the system 30 gets closer to the buried object and the sensed electromagnetic signal gets stronger. This number gets smaller as the system 30 gets further away from the buried object and the sensed electromagnetic signal gets weaker. An octagonal "track" pattern 174 has a rectangular signal strength indicator 176 with an internal chevron symbol that continuously moves in a non-linear manner around the pattern 174 to indicate the change in sensed electromagnetic signal strength. Clockwise movement of the indicator 176 represents increased signal strength whereas counter-clockwise movement of the indicator 176 represents decreased signal strength. Thus, the moving signal strength indicator 176 provides a convenient analog representation of the variation in sensed signal strength. Each revolution of the indicator 176 around the octagonal pattern 174 is matched by a corresponding audible tone or sound that indicates larger or smaller sensed signal strength. A naked chevron maximum signal marker 178 marks the point of maximum signal strength and appears when the sensed signal begins to decrease. In the SEARCH VIEW, each revolution of the signal strength indicator 176 is accompanied by a tonal amp, which can repeat for each revolution. This provides

an audible indication that represents both the direction and amount of signal sensed and mirrors the same information shown on the display 48 by the indicator 176.

Olsson at paragraph 50 (emphasis added). Based on the specification above, Olsson appears to be limited to only providing a display showing a cursor moving in a particular direction, wherein the movement of the cursor corresponds to the strength of a signal. The cursor does not relate to the direction of a signal in a conductor and nor does the line locator system determine the signal direction in a conductor. Olsson does not provide “means for determining a signal direction in a conductor; and means for distinguishing a target conductor based on the determined signal strength and signal direction” (emphasis added). Therefore, claim 37 is patentable over Olsson.

Claims 38, 44, and 47-49

The Examiner rejected claims 38, 44, and 47-49 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,942,360 (“Candy”).

Claim 44 recites “determining the signal direction in a conductor from the first frequency and the second frequency,” (emphasis added). The Office Action refers to Candy as citing this signal direction in a conductor. However, after reviewing Candy, Applicants believe that Candy is silent with respect to the signal direction in a conductor. Candy appears to be directed to detecting target objects within an environment, such as a ferrite environment, that provides either substantive reactive or resistive components of re-transmitted signal and not for determining the signal direction in a conductor. If the Examiner disagrees, Applicants respectfully request that Examiner provide their reasoning for this assertion. Thus, Candy fails to disclose “determining the signal direction in a conductor from the first frequency and the second frequency,” (emphasis added). Therefore, Applicants’ claim 44 is patentable over Candy.

Independent claims 38 and 47 include similar limitations. Claims 48 and 49 are dependent upon claim 47 and are allowable for the same reasons as claim 47. Therefore, Applicants' claims 38 and 47-49 are patentable over Candy.

Claim Rejections under 35 U.S.C. § 103

MPEP § 2142 requires to establish a prima facie case of obviousness that (1) the prior art reference must teach or suggest all claimed elements, (2) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference, and (3) there must be a reasonable expectation of success.

Claims 1, 8-13, and 29

The Examiner rejected claims 1, 8-13, and 29 under 35 U.S.C. 103(a) as being unpatentable over Olsson et al. in view of U.S. Patent No. 6,310,579 ("Meredith").

Claim 1 recites "wherein the modulated signal is configured to provide data concerning a direction of a signal to distinguish a target conductor, ," (emphasis added). However, the combination of Olsson and Meredith appear to be silent with respect to calculating and providing a modulated signal, wherein the modulated signal is configured to provide data concerning a direction of a signal to distinguish a target conductor. Olsson does not appear to disclose a modulated signal that is configured to provide data concerning a direction of a signal to distinguish a target conductor. Olsson teaches:

The preferred embodiment 30 of the sonde and line locator system of the present invention uses the multi-directional antenna arrays 44 and 46 (FIGS. 4 and 5) along with circuit means (FIG. 6) that includes advanced software programming to make pinpointing sondes and tracing buried lines fast, accurate and easy. The

GUI implemented via the display 48 (FIGS. 2 and 7) allows the operator to "see" the fields and to quickly resolve complex locating problems. The preferred embodiment 30 measures and displays electromagnetic fields emitted by long conductors such as energized wires, video inspection camera push cables, conduit or pipes when in its tracing mode. The passive AC tracing mode is a specialized case of the tracing mode where the line is already energized with 50 or 60 Hz electrical power. Active transmitters such as sondes are located in the sonde mode. Unlike conventional paddle or stick locators, which can only measure signal strength in the direction of the individual antenna(s), the preferred embodiment 30 measures both signal strength and field angles in three dimensions (3D). This enhanced capability makes it possible for the preferred embodiment 30 to indicate a mapping display on the LCD 48.

Olsson at paragraph 45 (emphasis added). Olsson further provides:

Referring to FIG. 11, in the SEARCH view a numeric (digital) signal strength is indicated at 172 on the display 48. This number gets larger as the system 30 gets closer to the buried object and the sensed electromagnetic signal gets stronger. This number gets smaller as the system 30 gets further away from the buried object and the sensed electromagnetic signal gets weaker. An octagonal "track" pattern 174 has a rectangular signal strength indicator 176 with an internal chevron symbol that continuously moves in a non-linear manner around the pattern 174 to indicate the change in sensed electromagnetic signal strength. Clockwise movement of the indicator 176 represents increased signal strength whereas counter-clockwise movement of the indicator 176 represents decreased signal strength. Thus, the moving signal strength indicator 176 provides a convenient analog representation of the variation in sensed signal strength. Each revolution of the indicator 176 around the octagonal pattern 174 is matched by a corresponding audible tone or sound that indicates larger or smaller sensed signal strength. A naked chevron maximum signal marker 178 marks the point of maximum signal strength and appears when the sensed signal begins to decrease. In the SEARCH VIEW, each revolution of the signal strength indicator 176 is accompanied by a tonal amp, which can repeat for each revolution. This provides an audible indication that represents both the direction and amount of signal sensed and mirrors the same information shown on the display 48 by the indicator 176.

Olsson at paragraph 50 (emphasis added). Based on the specification above, Olsson appears to be limited to only providing a display showing a cursor moving in a particular direction, wherein the movement of the cursor corresponds to the strength of a signal. The cursor does not relate to the direction of a signal in a conductor and nor does the line locator system determine the signal

direction in a conductor. Olsson does not provide “the modulated signal is configured to provide data concerning a direction of a signal to distinguish a target conductor,” (emphasis added). In addition, Meredith does not overcome the deficiencies of Olsson. Therefore, Applicants’ claim 1 is patentable over Olsson in view of Meredith.

Claim 29 includes similar limitations and is patentable for the same reasons as claim 1.

Moreover, claims 8-13 depend from claim 1 and require all of the limitations of claim 1. Therefore, claims 8-13 are also patentable over Candy.

Claims 39, 45, and 46

The Examiner rejected claims 39, 45, and 46 under 35 U.S.C. 103(a) as being unpatentable over Candy in view of U.S. Patent No. 5,260,659 (“Flowerdew et al.”).

Flowerdew does not overcome the deficiencies of Candy regarding claims 39, 45, and 46. Claims 39, 45, and 46 are dependent upon claims 38 and 44 respectfully, and are patentable for the same reasons as claims 38 and 44. Therefore, claims 39, 45, and 46 are allowable over Candy in view of Flowerdew.

Claims 40-43

The Examiner rejected claims 40-43 under 35 U.S.C. 103(a) as being unpatentable over Candy in view of U.S. Patent No. 4,723,216 (“Premerlani”).

Premerlani does not overcome the deficiencies of Candy regarding claims 40-43. Claims 40-43 are dependent upon claim 38 and are patentable for the same reasons as claim 38. Therefore, claims 40-43 are allowable over Candy in view of Premerlani.

Allowable Subject Matter

Applicants thank the Examiner for indicating that claims 2-7, 14-28, and 30-36 would be allowable if they included the features of the claims from which claims 2-7, 14-28, and 30-36 depend. Applicant has amended claims 2, 3, 7, 14 and 30 to be in independent form and to include the features of the claims from which claims 2, 3, 7, 14 and 30 originally depended upon. Therefore, as indicated by the Examiner, claims 2, 3, 7, 14 and 30 are allowable over the prior art. Claims 4-6, 15-28, and 31-36 which depend on claims 3, 14, and 30 respectfully, are patentable for at least the same reasons as claims 3, 14, and 30.

Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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